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Two New Taxa of *Hylotelephium* from Japan (Crassulaceae)

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ベンケイソウ属の2新分類群

大場秀章

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1) A lithophilous variety of *Hylotelephium verticillatum* (L.) H.Ohba, var. *lithophilos,* was described from Shodo-shima Island, western Japan. 2) A putative hybrid between *Hylotelephium cauticolum* and *H. erythrostictum* was described and named *H.* ×*furusei.*

1) **A lithophilous variety of *Hylotelephium verticillatum* from western Japan** Species of *Hylotelephium* show wide ranges of variation in gross appearance, a part of which might be caused due to cytological polymorphism. *Hylotelephium verticillatum* (L.) H.Ohba grows throughout Japan and also from east Siberia including Kamchatka to Korea and China through Sakhalin and Kuril Islands, and shows an extremely wide range of variation in some morphological characters such as shape, size, arrangement and serration of leaves. Funamoto and Yuasa (1986) explained that *H. verticillatum* is composed of several cytotypes with different chromosome numbers. In Japan *H. verticillatum* is included in a species group with *H. sordidum* (Maxim.) H. Ohba and *H. viride* (Makino) H. Ohba. Ohba and Amano (1990) mentioned the difference between *H. verticillatum* and *H. sordidum.*

The leaves of *H. verticillatum* are usually ternate, but rarely quaternate or opposite. The common form of *H. verticillatum* has short petiolate, oblong or oblong-lanceolate, ternate or rarely quaternate leaves. *Hylotelephium verticillatum* occurs in various sites from cool-temperate to warm-temperate zones. *Hylotelephium viride* is apparently different from the common form of *H. verticillatum* by having opposite, ovate leaves with long petioles and distinctly stipitate round ovaries (Ohba 1982).

A peculiar form of *H. verticillatum* occurs in Shodo-shima Island in Seto Mediterranean Sea between Honshu and Shikoku, where it grows on rocks or gravelly slopes in shade places. This form approaches to *H. viride* in having opposite or rarely ternate, often short petiolate leaves, and often makes weak the clear distinction between *H. verticillatum* and *H. viride. Hylotelephium viride* grows mainly on tree trunks in forests classified in the lower part of cool-temperate zone or "intermediate temperate" zone in altitudinal distribution of vegetation, while the form of *H. verticillatum*

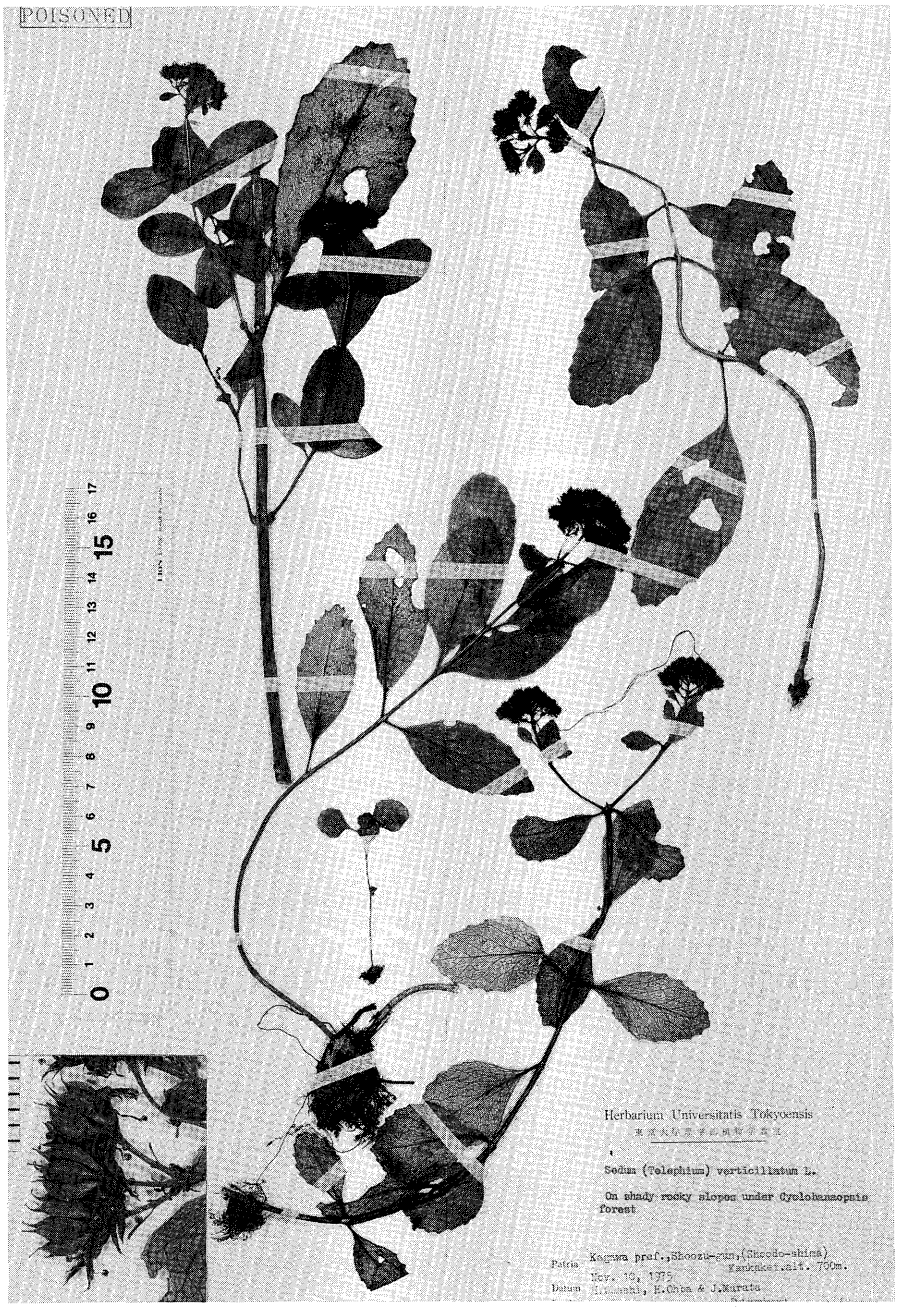

Fig. 1. Type specimen of *Hylotelephium verticillatum* var. *lithophilos.*

occurs in warm temperate zone. The base of ovaries are tapering but not stipitate. This agrees with that of the common form of *H. verticillatum,* and differs from *H. viride* and *H. sordidum*. The form, therefore, cannot be included in the variation ranges of *H. viride* and *H. sordidum*. Therefore, it should be recognized as a variety of *H. verticillatum* and named var. *lithophilos* in connection with its lithophilous nature.

Two specimens collected at a limestone area in

Niimi-shi, Okayama Prefecture (Hara & Kurosawa s.n. on October 28, 1975, TI) are identical with this variety. The occurrence suggests that this variety may occur widely at tuff or limestone areas in western Honshu and Kyushu in warm-temperate zone.

Funamoto and Yuasa (1986) reported 2n = 92 for the plants of Niimi-shi and Shodo-shima. Mr. Makoto Amano gave me information of 2n = 92 for var. *lithophilos*.

Praeger (1918) described *Sedum verticillatum* var. *nipponicum* and wrote that this was probably a wild Japanese form but at present known only from gardens in Nippon and England. Var. *lithophilos* may possibly be var. *nipponicum,* but the identity of var. *nipponicum* can not be fully revealed. *Sedum shimizuanum* Honda, described from Mt. Ogurasan, Province Shinano (now Nagano Prefecture), seems to be a different form of *H. verticillatum*.

Hylotelephium verticillatum (L.) H. Ohba var. **lithophilos** H. Ohba, var. nov.

A var. *verticillato* foliis oppositis, plus minusve petiolatis anguste ovatis vel lanceolatis bene differt. Differt a *Hylotelephio viride* (Makino) H.Ohba ovariis sessilibus et foliis majoribus ad 9 cm longis 4.5 cm latis.

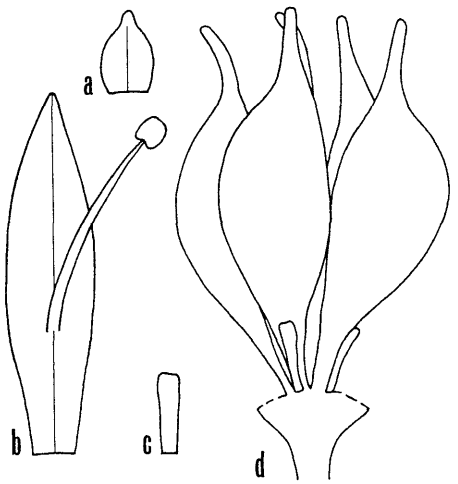

Fig. 2. Flower of *Hylotelephium verticillatum* var. *lithophilos*. a: calyx-lobe. b: petal with stamen. c: nectar-scale. d: ovaries. ×5.

Flowering stem ascending or decumbent, up to 40 cm long, 5 mm wide near the base. Leaves opposite, petiolate, thick herbaceous, deep green above, glabrous and smooth. Petioles 10 to 18 mm long. Lamina oblong, ovate, lanceolate or oblanceolate, 3–9 cm long, 3.0–4.5 cm wide, apex round, base round or attenuate, margin shallowly crenulate with 6 to 8 teeth. Inflorescence a compound cyme with 20 or more flowers. Bracts oblanceolate, less than 5 mm long. Flowers congested, pedicelate; pedicels usually 5 mm long, often with a linear bracteole less than 1 mm long at the basal one third. Calyx-tube ca. 1 mm long; lobes oblong-ovate, apex apiculate, 1.1–1.3 mm long, ca. 0.8 mm wide. Petals linear, 4.5–5 mm long, 1.1–1.2 mm wide, apex acute, suberect at anthesis, whitish or pale green. Stamens shorter than the petals, 4–5 mm long, the epipetalous ones inserted 1.5–1.7 mm from the base; anthers oblong, ca. 0.6 mm long, ivory yellow before dehiscence. Nectar-scales linear, ca. 1 mm long, ca. 0.2 mm wide, apex truncate, deep yellow. Gynoecium 4.5–5.5 mm long, ovaries erect at anthesis, base attenuate, ventrally slightly round, ca. 1.6 mm wide at the middle, tapering upwards, the style indistinguishable from the ovary, the placenta marginal. Ovules ca. 6 in each locule. Seeds linear, ca. 1.7 mm long, winged.

Specimens examined: Japan. Kagawa Prefecture, Shoozu-gun (Shodo-shima), Kankakei, alt. 700 m (H. Ohashi, H. Ohba & J. Murata s.n. on November, 1975, TI-Holotype); ibid. (N. Satomi s.n. on 24 Oct. 1962, TI). Okayama Pref., Niimi-shi, Taniai, in bamboo thicket in lime stone area (H. Hara & S. Kurosawa s.n. on 28 Oct., 1975, TI).

2) **A putative hybrid between *Hylotelephium cauticolum* and *H. erythrostictum*** Mr. Miyoshi

Furuse, a famous plant collector, has supplied me several sheets of an interesting *Hylotelephium*. The plant arose naturally in his private garden at Minagawa Jonai, Tochigi Prefecture, and was considered to be a putative hybrid between *H. cauticolum* (Praeger) H. Ohba and *H. erythrostictum* (Miquel) H. Ohba by him, because he had cultivated both putative parents in his garden. As the result of the observation I agree with his speculation.

I classified *H. erythrostictum* in sect. Hylotelephium and *H. cauticolum* in sect.

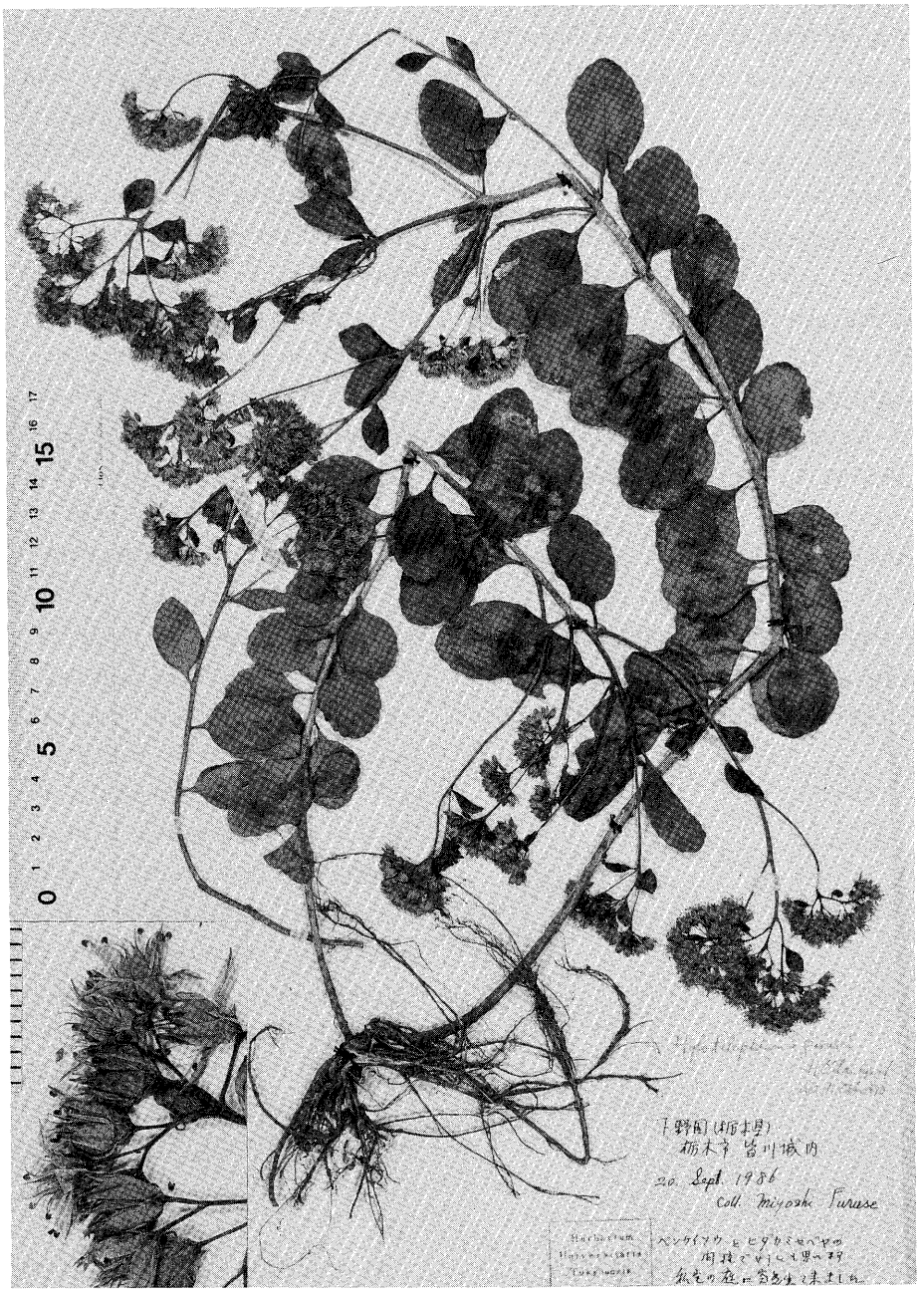

Fig. 3. Type specimen of *Hylotelephium* × *furusei*.

Populisedum (Ohba 1978). Section Hylotelephium is characterized by the flowering stem which is annual, usually arising from the adventitious buds on more or less conspicuous rootstocks. Section Populisedum is also done by an annual flowering stem, of which basal part is long persistent and more or less lignose, arising from the axillary buds on the basal parts of the annotinous flowering stem.

The gross appearance is approximately intermediate between those of the putative parent species, but slightly more approaches to *H. cauticolum* than the other such as the broadly oblong or ovate, less than 5 cm long and distinctly petiolate leaves. The flowering stem of *H. cauticolum* is ascending or decumbent but often procumbent, while that of *H. erythrostictum* is erect or ascending. The putative hybrid has a procumbent or decumbent flowering stem. The flowers of the putative hybrid are, however, a little close to those of *H. erythrostictum* particularly in shape and size of ovaries, nectar-scales. However, it could not be detected which parent may be female or male.

Cytologically both putative parent species contain tetraploid races and have n=24 or 2n=48 chromosome numbers (Baldwin 1937, Soeda 1944, Uhl & Moran 1972). It might be probable that the hybridization occurred between tetraploid parents with same chromosome numbers, though I could not observe the chromosomes. *H. cauticolum* is endemic to Hokkaido and *H. erythrostictum* is distributed only in Honshu and Kyushu. The hybridization between them hardly occurs in natural condition due to their allopatric distribution.

Kondo and Yuasa (1970) wrote that hybridization among the species of *Hylotelephium* was easy and horticulturally new cultivars be produced through hybridization. However, they did not mention the presence of the hybrid between *H. cauticolum* and *H. erythrostictum*. Though Evans (1983) mentioned the presence of hybrid-origin cultivars in *Hylotelephium,* non of them is identical with this putative hybrid.

Hylotelephium × furusei H. Ohba, hybr. nov.

H. cauticolum (Praeger) H.Ohba × *H. erythrostictum* (Miq.) H.Ohba.

Planta inter *H. cauticolum* et *H. erythrostictum* quasi intermedia et versimiliter ex hybridatione harum specierum orta, ab ambobus folliculis abortivis differt. Facie *H. cauticolum* prominenter simile, sed ovariis sessilibus foliis majoribus. A *H. erythrosticto* foliis late oblongis vel late ovatis, longe petiolatis, minoribus et ovariis apice longe attenuatis bene differt.

Herba perennis ad 50 cm longa. Caules floriferi procumbentes vel decumbentes, vulgo basi longe repentes, 4 mm lati, simplices, teretes, glabri, laeves. Folia opposita sed raro ternata vel alterna, potius remote disposita, glabra, laevia, petiolata, petiolo 5–10 mm longo; laminis crassiusculis, vulgo late oblongis vel late ovatis, apice rotundatis

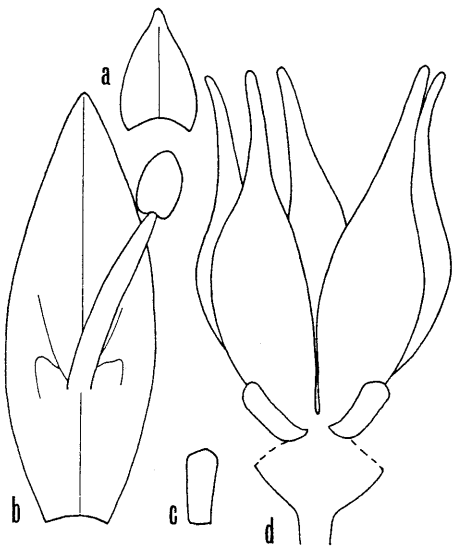

Fig. 4. Flower of *Hylotelephium* × *furusei*. a: calyx-lobe. b: petal with stamen. c: nectar-scale. d: ovaries. ×5.

basi rotundatis vel brevi-attenuatis, margine crenulatis (dentibus utrimque numero 6–8 orientibus), 2–4 cm longis 1.5–3.0 cm latis; costa utrimque non prominenti.

Inflorescentia composito-cymosa, terminalis, centi-floribus, bracteata; axibus priminalibus ad 5 cm longis, adscendentibus saepe dichasialiter ramificantibus, bracteis foliis caulinis similibus sed minoribus.

Flores hermaphroditi, quinque-partiti, 10–12 mm diametiente, pedicellati, pedicelo ad 4 mm longo, laevi. Calyces ad basin (longitudine ca. 1 mm) connati, lobis late vel modice triangularibus vel triangulari-ovatis, adscendentibus sub anthesi. Petala rosea, libera, lanceolata, apice acuta, 5.5–6 mm longa 2–2.2 mm lata, ± cymbiformia, erectiuscula sub anthesi. Stamina numero 10, filamentis filiformi-linearibus, sub anthesi erectis, epipetalis longitudine ca. 1.5 mm e basin connatis, alternipetalis ca. 5 mm longis; antheris oblongis, 0.7 mm longis, ante dehiscenti melano-purpureis. Glandulae 0.7–0.8 mm longae ca. 0.3 mm latae, lineares apice rotundatae vel truncatae, aurantiluteae. Gynoecia 5–6 mm longa; ovario libero, sub anthesi erecto, latere ventrali sine gibbbositate, 1.2–1.3 mm lato, stylo indistincto, apice ± papillato, placenta marginali, ovulis in quoque loculo numero 12–14, usque 1.3 mm longis sed abortivis.

Type: Japan. Cultivated at Furuse's private garden in Minagawa Jonai, Tochigi-shi, Tochigi Prefecture (Miyoshi Furuse s.n. on 20 September, 1986, TI).

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要 旨

1）瀬戸内海の小豆島には花茎が斜上または基部で這い，有柄の葉を対生するミツバベンケイソウの一型がある．これは岩上や礫の多いスギ植林などの林床に生えている．この型は葉が対生すること，有柄なことでアオベンケイと紛らわしいが，子房はミツバベンケイと同様で柄がなく，この型をアオベンケイに含めることはできない．しかし，アオベンケイとの系統関係を考える上では重要な

存在といえ，15年以前これを初めて観察して以来，この型のミツバベンケイソウに注意を払ってきた．

この型に該当する可能性のある分類群として，Praeger（1918）が記載した*Sedum verticillatum* var. *nipponicum* がある．しかし，var. *nipponicum* についてはタイプをはじめとする証拠標本が見いだせないため，今日までその正体を正確に掌握できないでいる．本田正次教授が記載したチチブベンケイ*Sedum shimizuanum*は，小豆島の型に近似するが，ミツバベンケイソウの別の型であると考えられる．

しかし，小豆島で採取した型に類似の個体が岡山県新見市で見いだされている．このことは，小豆島の型と同一と考えられる個体が西日本に広く分布している可能性を示唆している．

なお，船本・湯浅（1986）はミツバベンケイソウにおいて2n＝22が北海道と栃木県，2n＝46が長野県，2n＝92が小豆島を含む本州西部に分布することを報告した．小豆島の問題の個体は天野誠氏によって2n＝92と推定されている（未発表）．このことはアオベンケイが同じ染色体数をもつ点で興味深い．

学名には好岩性を意味する名前を与えたが，和名にはショウドシマベンケイソウを提案したい．

2）有名な植物採集家である，古瀬義氏は同氏の庭で実生から生じた興味深いベンケイソウを提供してくださった．氏はそれを庭で栽培していたベンケイソウとヒダカミセバヤの雑種と推定された．

私はベンケイソウとヒダカミセバヤはベンケイソウ属内の別の節に分類する説を発表していたため，この植物に興味をもって検討を行った．

この植物は古瀬氏が推定するように，ベンケイソウとヒダカミセバヤとの中間的形態をもち，両種間の雑種と推定されるが，外形ではヒダカミセバヤに，花の形態ではベンケイソウに近い状態を示す．

ベンケイソウ属の種間雑種は比較的容易にでき，園芸上は新しい栽培品種の作出に利用されている．しかし，この植物に一致するものは見いだせなかった．*Hylotelephium* ×*furusei*と命名し，発表することにした．ミセバヤベンケイの和名を提案する．